

## Ketterson / Nolan Research Group Collection

This document is part of a collection that serves two purposes. First it is a public archive for data and documents resulting from evolutionary, ecological, and behavioral research conducted by the Ketterson-Nolan research group. The focus of the research is an abundant North American songbird, the dark-eyed junco, *Junco hyemalis*, and the primary sources of support have been the National Science Foundation and Indiana University. The research was conducted in collaboration with numerous colleagues and students, and the objective of this site is to preserve not only the published products of the research, but also to document the organization and people that led to the published findings. Second it is a repository for the works of Val Nolan Jr., who studied songbirds in addition to the junco: in particular the prairie warbler, *Dendroica discolor*. This site was originally compiled and organized by Eric Snajdr, Nicole Gerlach, and Ellen Ketterson.

### Context Statement

This document was generated as part of a long-term biological research project on a songbird, the dark-eyed junco, conducted by the Ketterson/Nolan research group at Indiana University. For more information, please see IUScholarWorks (<https://scholarworks.iu.edu/dspace/handle/2022/7911>).

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## NEST.2007

(last revised, May 17, 2007, please confirm accuracy)

So you found a nest.....(Congratulations!)

When you return to the lab, please fill out a nest log sheet, including a good description of state of the nest when you found it, the identity of the adults, and *precisely* where it is. Nicki, will fill in the hatching and fledging dates, but you need be very clear about how to find the nest and its status when found. A nest does not get a number until it has eggs, but it can get a sheet when it's found to help keep track of its progress.

From here on out, please record on the nest log the state of the nest when you visit (stage of building, number of eggs, whether eggs look fresh or well incubated, how many nestlings, whether eggs gone and nest disturbed by predator, etc.), and anything else of interest (a death, a visit from a neighboring male, a copulation, the fact that the nest was filmed or recorded, **anything at all**). You may also need to record some of the same information in other logs, e.g., nestling weight sheets, but the nestlogs are where we turn in order to piece together what really happened to the birds, so they need to be complete. To repeat, we won't be going back to your field notebooks; we will look to the nestlogs.

**Please see sample nestlog prepared by Tracey Kast on the bulletin board in the lab.  
Be sure to write so that others can read your writing.**

### 1. Estimating hatching date (see separate instructions, Eggs, sex & independence)

**Please take great care when working with eggs.** Also we believe that it's important not to impart your scent to the nests or eggs, so to minimize nest predation, we recommend that you rub your hands in moist soil or ferns before touching eggs. Finally be sure to coordinate with others so we are not visiting nests more than one time per day.

- For nests found during building, return each day to determine when laying begins and ends so we can have accurate estimates of time required to build nest and of clutch size and hatching day.
- When you visit a nest with eggs, note whether the female is on the nest. If she is off the nest, always note if the eggs are warm (with scent free hands).
- For nests found prior to laying we will mark the eggs with a sharpie.
- For nests found prior to incubation we will be collecting one egg. If eggs are marked, take the 3<sup>rd</sup> egg. For eggs that are not marked use a 5g pesola and your eye to determine the largest egg and take that. Please note we will collect only 1 egg per female, so be sure to determine whether an egg has already been collected from a female before you take the egg.

Incubation typically lasts 12 days, and the female typically begins to incubate the night before the day the last egg is laid (sometimes sooner as the season progresses). So, for example, if egg 4 is laid on May 1st, we expect hatching on May 12th. In a particularly cold spring incubation can run longer, but incubation is rarely (never?) less than 12 days. For all the studies we are doing this year, it is important that we know hatching day. Estimates need to be as accurate as possible.

For nests found after incubation has begun, be sure to note the condition of the eggs when you first find them. Are they translucent as if they have just been laid, or are they opaque indicating that development is underway? Or are they just about to hatch, i.e., pipped? This will help Nicki guess when they might hatch. Please visit nests with unknown hatching dates every second or third day in order to determine when the eggs hatch (Preparer of the daily list will note when nests need to be delivered).

Beware: we need to keep disturbance to a minimum. We don't want females to start flushing too readily because our visits have been too frequent. If they do, they presumably become higher risk candidates for predation. So please don't flush a female unless it's necessary. Rather, if she's on, come back later and see what's up (females incubate roughly 70% of the time). Please use the sign-up sheets to be sure that nests are not visited by different people on the same day. If someone else signed up to check the status of a nest, then leave it alone. **If you agreed to check the status, be sure that you do it.** Also don't touch more than necessary, again because of predators.

## 2. Parasitism rate

We want to know the rate of parasitism and how it varies annually and seasonally. We also don't want to have cowbird hatchlings in our nests. If a nest found during laying and has a cowbird egg in it, leave it until after the clutch is complete. If you were to remove it earlier, you might cause the female to desert. When the clutch is complete, then remove cowbird eggs. **Make careful notes and be sure to record in the nestlogs what you did.**

## 3. Determining nest fates

If a nest has failed, please note the circumstances. Was the nest lining torn out? Was the bottom smooth and unmussed? Were there any feces in the nest? Look around the nest very carefully. Do you see feathers from the female? Do you see bits of shell, partly eaten babies or color bands? Look carefully to see what you can see. Look beyond the nest itself, under it if it is elevated. Keep thorough notes and enter them in the nest logs!!

## 4. Determining time of hatching and weighing and measuring young (minimum data required for each nest is number hatched at day 0, number at day 6 + blood for DNA, and number fledged)

### a. Hatching day (day 0)

On hatching day (day 0), we need to count the number of young, weigh them, and measure their tarsi. Weighings and measurements are done in the afternoon. Frequently, three eggs hatch one day, and one hatches on the next day. If any eggs remain unhatched, then return the next day to process the young that have hatched in the meantime. If there are eggs that have still not hatched 24

hours after the first egg hatches, and it is obvious that they will never hatch, bring them back to the lab and fill out an “Unhatched Egg” sheet. Eggs that were punctured (by us or by the birds) and are light in weight and will never hatch. The same is true of eggs that are out of balance because they have dried out (eggs like this roll in circles on a flat surface). Eggs that remain translucent never developed and can be brought back. Eggs that fail during development are often dark looking. We are very interested in evidence of this kind of infertility, so as always keep complete notes and enter findings in nest logs.

If there is still a chance that an egg will hatch (no obvious flaws, obviously developed), then go back the next day (maybe day 2 for the earliest hatched young, see below) and either process the last hatched young or bring the egg(s) back to the lab for processing. We need to determine whether the embryos developed so we can assess infertility; we may also preserve embryos for DNA. Note the return of any eggs to the lab on the nest-logs. Eric will open these eggs and decide whether they show any signs of development under the microscope.

Enter on nest log that young have been weighed, and fill out a nestling weight sheet. Nests should be aged according to the majority of nestlings in the nest. If one hatches on Tuesday and three hatch on Wednesday, then Wednesday is day 0. If two hatch one day and two hatch the next, call day 0 (for the nest) the day that the first two hatched. Nests should be aged by their status in the PM.

Traditionally, we weighed nestlings and measured their tarsi on days 0, 3, 6 and also on fledging day. We began to skip the day 3 weighing some years ago. As of now, I would like to continue monitoring the number of young at day 0 (hatching), day 3, day 6, and fledging day, but not to measure the young on day 3. This helps us keep track of when predation occurs without adding much to the work load or the level of disturbance.

Note: In some years we have measured exact incubation periods and related hatchings to their eggs (see separate instruction sheet on Egg, Sex & independence). The idea here was to determine how long it takes the eggs to hatch, or, more precisely, how long after the first egg hatches, does the last egg hatch. We made ‘hatch checks’ on the expected day of hatching, going to the nest during four time periods to note which eggs had hatched and entered the data on a hatch check sheet. To reduce the level of disturbance, we did not do this in 2003, 2004 or 2005, and unless someone prefers otherwise, we will not do it in 2006.

### c Day 3

*Coordinate with Nicki/Erin and Dawn as to whether we will be measuring on day 3 for symmetry and taking blood for innate immune function.*

On day 3 visit the nest to determine the number of young. **Always** be on the look out for definitive information about who the parents are. Bands seen? food in bill? close approach and chipping? Nests with unknown adults are not worth much, especially for relatedness. Remember, the nest can fail at any time, and the opportunity to know who the parents are is lost forever.

d. *Day 6 (traditional day of band and bleed, in 2007 need to coordinate with Dawn who will be capturing the female in the AM to bleed and inject adult female PHA, and Nicki/Erin who*

*will be measuring nestling symmetry, digit ratios, and doing PHA injections in the PM and returning on day 7 to measure swelling.*

If by day 6, you are not sure who the parents are, ***watch the nest until both adults have fed the young and their bands have been identified.*** We simply cannot have nests in which we have blood from young but are not sure who the parents are. If you find that one of the parents has still not been bled, alert the crew and make this a TOP priority. If the nest fails there is no way ever to be sure who are parents are.

On day 6, band and bleed the young. Be sure to use unique band combinations (see lists by Nicki). Collect two or three tubes of blood from each nestling. Store the blood on ice (**don't let it freeze!**) and be sure not to mix up any samples. If you are not SURE whose blood is in a particular microhematocrit tube, please do not guess. It would be MUCH better to take a single sample from the bird the next day.

Return to lab to process blood samples. AGAIN, BE SURE TO KEEP STRAIGHT WHO IS WHO! This is simply essential. If for **any** reason, you are not sure, please do not forge ahead. Write a LONG note about what went wrong and the basis for your best estimate as to what is correct. ). If necessary, plan to bleed the nestlings again the next day or at fledging (recalling that the nest might fail). Warning do not attempt to handle the young after day 7.

e. *Day 9*

On day 9, check the nest to determine whether it is still active (do parents chip? **do they have food? do you see them feeding? going to and from nest? if you can see the nestlings estimate the number of nestlings present.**). **Remember, do not touch the young or go too close to the nest after day 7 or you may cause premature fledging and the young are likely to die!** Simply check it out. Don't harass the adults.

f. *Fledging day minus one (DAY 11)*

On the afternoon of day 11 (early in the spring, later in summer go on day 10), go to the nest and attempt to count the young. If you are in doubt about the age of the young, please be conservative and go on what you think is day 10. **Do not touch the young.** If it is a nest where you simply cannot see (way back in the roots of a treefall, but sometimes a flashlight helps), then simply note whether the nest is active (e.g., parent with food chipping at you). Then state in the nest log that there was no way to be certain of the number of nestlings without risking early fledging.

Assess the situation for catching the young and the adults the next day. Set up a net (**or nets**) (**it helps to have 2 people to do this**) and do it in a way that will intercept the adults – or at least the female - as she goes to the nest to feed the young. Consider the light (i.e., visibility of the net to the parents) in the early morning and observe behavior because the adults typically use the same path to and from the nest. Then make a decision about the best time to return the next day to do the catching. E.g., given the lighting or the traffic on the road, is this one where you need to get there at dawn if you are to be successful?

g. *Fledging day* (not before DAY 12, later in the year this will be moved up to day 11)

(1) When to go and what to take:

Go in the morning and take the following items: Bird bucket or bag; net, poles, stakes, and hammer (if net is not already set up); cooler with ice, bleeding kit, fledgling scream tape and tape recorder; and a potter trap; Balance, calipers, bands, if necessary, and data sheets

(2) Begin by catching the adults.

Catch and weigh the adults. Based on the date, decide whether to remove the female's implant. *For 2007, if the male has already been bled for DNA this year, then we will not bleed him on fledging day. For the female we will take a blood sample for hormones if she has not been bled within the last week (check the updated blood list)(please confirm).* BE SURE there is a DNA blood sample for each adult. If you are unable to catch the adults by intercepting them, and they still need to be caught (e.g., to be weighed, to determine the band number, to get their blood for DNA), then you can catch them by using the young. To do this, grab the young (see below) and place them in a trap beneath the net. Then use a tape of fledgling screams placed next to the trap to get the adults in the net.

(3) Now take the young and process (mass, ID, tarsus. Symmetry, etc.).

**THE COUNT OF THE YOUNG IS EXTREMELY IMPORTANT.** You also need to weigh them and measure their tarsi. Be extremely alert when you go for the young, or some will slip past you and you will spend lots of time tracking them down. Have a container ready. Approach the nest slowly with your hands in front of you. Extend one or both slowly until you are in a position to strike at the nest (as before, the way a snake strikes its prey). When ready, strike with your open hand and cover the nest cavity so that no young can get out. Close your hands over the young and nest. In other words, grab the young and the nest as a unit. Have a back-up person if possible. Put all the young in the same bird bucket (with their parents if you have already caught the parents because parents remain calmer if they are with the young).

After the young are processed, ordinarily you put them back in or near the nest. They won't stay, but the parents will know where to look for them.

If you still need to catch the adults, and you don't have a trap, then put the bucket with young beneath the net. The young will call and the adults should fly into the net immediately. Treat adults as above. If you don't catch them right away, try using the tape. Keep track of time and conditions.

If the adults finally prove too wary to be caught, then process the young. If after having processed them you still need to capture the adults, then you can use the young to catch the adults (see above). Put them in one cell of a potter trap and place vegetation around the trap so the only way the parents can get to the young is by entering the cell adjacent to the young. Put the trap near the net. Hope; and don't let the young get hurt or too hungry. **Congratulations to you and to the juncos - they are launched!**